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10/800,569	03/15/2004	Hideo Yoshizawa	KON-1859	9832

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EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/800,569	YOSHIZAWA ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The examiner acknowledges the amendments to claims and the cancellation of claim 4 set forth in the amendment filed on Jan. 10, 2006. Claims 1-3 and 5-19 are pending.

The "Amendment to the specification" section set forth in the amendment filed on Apr. 4, 2006, has been entered.

2. The "Amendment to the specification" section set forth in the amendment filed on Jan. 10, 2006, does not comply with 37 CFR 1.121 for the reasons discussed in the Notice of non-compliant amendment mailed on Mar. 31, 2006. Accordingly, that "Amendment to the specification" section has not been entered.

3. The objection to the drawings set forth in the office action mailed on Oct. 12, 2005, paragraph 1, has been withdrawn in response to the amended paragraph at page 7, second full paragraph, of the specification, set forth in the amendment filed on Apr. 4, 2006.

The objections to the specification set forth in the office action mailed on Oct. 12, 2005, paragraph 2, have been withdrawn in response to the amended paragraphs at pages 6, 26, 31, and 32, of the specification, set forth in the amendment filed on Apr. 4, 2006.

The rejection of claim 8-11 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Oct. 12, 2006, paragraph 5, has been withdrawn in response to the amendment to claim 8 set forth in the amendment filed on Jan. 10, 2006.

4. The examiner has determined that the instant specification has defined the following terms:

(1) The term "average circular degree," i.e., shape coefficient, of the toner is defined at page 16, line 12, to page 17, line 5, of the specification, as the average value of the equation:

shape coefficient = (circumference length of the circle calculated from the circle equivalent diameter of the toner particle)/(circumference length of the projection image of the particle).

(2) The term "surface roughness Ra" recited in instant claim 4 represents a "center line roughness Ra defined in JIS B601 was extended to three dimension so that it can be applicable to a measured plane and is 'a value averaging absolute values of a deviation from a standard plane to a specified plane,' being expressed by" the equation disclosed at

page 14, line 14, to page 15, line 4, of the instant specification.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 is indefinite in the phrase "forming toner images by individually developing each of the latent images" because it is not clear what is developing each of the latent images. It is not clear whether each of the latent images is being developed with different developers. It is also not clear whether each of the latent images is required to be developed with a toner having the circular degree and comprising the wax recited in instant claim 1.

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. The reference US 2003/0180646 A1 (Asano) was published on Sep. 25, 2003, prior to the filing date Mar. 15, 2004, of the instant application. Accordingly, Asano qualifies as prior art under 35 U.S.C. 102(a), as well as under 35 U.S.C. 102(e).

9. Claims 1, 2, 5-9, 12-15, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano combined with US 2002/0076636 A1 (Uchida).

Asano teaches an image forming method that meets the steps recited in the instant claims but for using the particular toner recited in the instant claims. The Asano method comprises the steps of: (1) developing a latent image on a photoreceptor with a developer comprising a toner; (2) transferring the toner image to a recording medium; (3) fixing the toner image to the recording medium; and (4) removing the toner remaining on the photoreceptor with a cleaning device. Asano further teaches a full color image forming method comprising the steps of: (1) forming four electrostatic latent images on four photoreceptors, which correspond to a yellow image, a magenta image, a cyan image, and a black image, respectively; (2)

developing the four latent images, respectively, with a yellow toner, a magenta toner, a cyan toner, and a black toner; (3) transferring the yellow toner image, the magenta toner image, the cyan toner image, and the black toner image from the four photoreceptors to a receiving member; (4) fixing the toner images to the receiving member; and (5) cleaning the toner remaining on each of the four photoreceptors with a cleaning device. Fig. 1; and paragraphs 0048-0051, 0061, and 0371. The photoreceptor comprises a conductive substrate and a surface layer that comprises hydrophobicity treated silica particles having a number average particle size of 45 nm. The surface layer has a surface roughness of 35.6 nm, i.e., 0.0356 μm. See Preparation of Photoreceptor 22 in paragraph 0356 and in Table 6 at page 25, example 8. (Note that the photoreceptor nos. listed in Table 6 should have the numeral "2" before the stated number, e.g., 22 in example 8.) The Asano surface roughness Ra has the same definition as the surface roughness Ra recited in instant claim 4. See Asano, paragraphs 0116-0120 and paragraph 4 supra. The photoreceptor surface layer meets the surface layer limitations recited in instant claims 1, 2, 4, 12, and 19. The cleaning device comprises an elastic rubber cleaning blade **66A** and a brush **66C**. Fig. 5, and paragraphs 0070 and 0077. The cleaning blade **66A** contacts the photoreceptor in a direction

counter to the rotating direction of the photoreceptor, as recited in instant claim 7. Paragraph 0072. The brush **66C** comprises fibers having a thickness of 5 to 20 deniers. Paragraph 0084. The upper limit of the Asano fiber thickness range of 5 to 20 deniers is within the thickness range 6 to 30 deniers recited in instant claim 9. The Asano fiber thickness range also overlaps the range recited in instant claim 9. The cleaning blade meets the cleaning blade limitations recited in instant claims 6-8. The brush meets the brush limitations recited in instant claim 8 and 9.

As discussed supra, Asano does not disclose the use of the particular toner recited in the instant claims. However, Asano does not limit the type of toner used. Asano, paragraph 0010 and reference claim 1.

Uchida discloses a black toner comprising a colorant, a binder resin, and the ester wax no. 21, pentaerythrytol tetrabehenate. The toner has an average circularity of 0.964 with a standard deviation of circularity of 0.031. Ester compound No. 21 at page 3; Latex 1 in Table 1 at page 11; color particles group 1 in Table 2 at page 12 and Table 5 at page 13. The ester wax no. 21 meets the wax limitations recited in instant claims 1 and 15. The Uchida average circularity and standard deviation of circularity fall within the ranges of

average circular degree and standard deviation of circular degree recited in instant claims 1 and 13 and in claim 14, respectively. The Uchida average circularity and standard deviation of circularity have the same definitions as the average circular degree and standard deviation of the circular degree recited in the instant claims. Uchida, paragraphs 0112-0113 and paragraph 4 supra. Uchida further discloses a yellow toner, a magenta toner, and a cyan toner that meet the toner limitations recited in instant claims 1 and 13-15. According to Uchida, its toner has excellent high fixing characteristics without the occurrence of offset. The toner provides high quality images after long storage. The toner provides stable images for many repeated uses. The toner minimizes the problem of photoreceptor filming and "deformation of image blurring." Paragraph 0005 and Tables 7 and 8, example 1.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Uchida, to use the Uchida toners in the image forming methods disclosed by Asano. That person would have had a reasonable expectation of successfully obtaining image forming methods that provide stable high quality single toner images or stable high quality full color images as taught by Uchida.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asano combined with Uchida, as applied to claim 8 above, further in view of additional teachings in Asano.

Asano combined with Uchida renders obvious an image forming method as described in paragraph 9 above, which is incorporated herein by reference. As discussed in paragraph 9 above, the Asano cleaning device comprises the brush **66C**. Asano further teaches that the density of brush fibers of the brush is from $4.5 \times 10^2/cm^2$ to $2.0 \times 10^4/cm^2$ (number of brush hairs per one square centimeter). Asano, paragraph 0086. The Asano density of brush fibers overlaps the density range of $4.5 \times 10^2/cm^2$ to $15.5 \times 10^2/cm^2$ recited in instant claim 10. Asano teaches that if the density of brush fibers is less than $4.5 \times 10^2/cm^2$, "not only rigidity is low and abrasion pressure is weak but also uneven abrasion is caused, which makes uniform removal of adhered substances impossible." If the density of brush fibers is not less than $2.0 \times 10^4/cm^2$, the "brush becomes too rigid to increase abrasion pressure which abrade a photoreceptor, resulting in generation of image defects such as fog due to reduced sensitivity and black streaks due to abrasion marks." Paragraph 0086. Thus, the reference appears to recognize that the density of brush fibers is a result-effective variable. The

optimization of a result-effective variable is presumably within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Asano, to adjust, through routine experimentation, the density of the brush fibers in the cleaning brush in the Asano cleaning device, such that the resultant density of the brush fibers is within the density range recited in instant claim 10, and to use the resultant brush in the image forming method rendered obvious over the combined teachings of Asano and Uchida. That person would have had a reasonable expectation of successfully obtaining an image forming method that effectively removes adhered substances from the photoreceptor and that provides toner images without the occurrence of fog and black streaks, as taught by Asano.

11. Applicants' arguments filed on Jan. 10, 1006, as applied to the rejections over Asano in paragraphs 9 and 10 above have been fully considered but they are not persuasive.

Applicants further assert that the Rule 131 declaration and the evidence that the inventors were in possession of the claimed invention before 102(e) date of Asano, Feb. 28, 2003, filed on Jan. 10, 2006, overcome the rejections over Asano set forth in paragraphs 9 and 10 above.

The declaration filed on Jan. 10, 2006, under 37 CFR 1.131 has been considered but is ineffective to overcome the Asano reference.

It fails to establish a reduction to practice of the invention in this country or a NAFTA or WTO member country prior to the effective date of the Asano reference.

The certified English-language translation of the published Japanese Patent Application P2004-205618 filed on Jan. 10, 1006, does not meet the requirements of 37 CFR 1.131(b) to show that applicants were in possession of the invention prior to Feb. 28, 2003. There is no showing of facts to establish a reduction to practice of the invention as required under 37 CFR 1.131(b). 37 CFR 1.131(b) states that "[t]he showing of facts shall be such, in character and weight, as to establish reduction to practice prior to the effective date of the reference . . . Original exhibits of drawings or records, or photocopies thereof, must accompany and form part of the affidavit or declaration or their absence must be satisfactorily explained" (emphasis added).

Furthermore, the declaration is insufficient because the declaration does not clearly state where in the certified translation, by page and line number, the facts to show completion of applicants' invention prior to the reference date

are present in the translation. It fails to provide a clear explanation of the facts or data pointing out exactly what facts are established and relied on by applicants to show completion of their invention prior to the reference date. The declaration states the "actual reduction to practice of the invention claimed in the US application 10/800,569 is prior to at least Japanese patent application filing date of December 24, 2002 . . . To establish the date of completion of the invention of this application, the following attached documents are submitted as evidence . . . Certified translation" of the Japanese patent application publication P2004-205618A. "Vague and general statements in broad terms about what the exhibits describe along with a general assertion that the exhibits describe a reduction to practice 'amounts essentially to mere pleading, unsupported by proof of a showing of facts' and thus, does not satisfy the requirements of 37 CFR 1.131." MPEP 715.07.I.

Accordingly, the Rule 131 declaration filed on Jan. 10, 2006, is ineffective to overcome the Asano references. The rejections set forth in paragraphs 9 and 10 above stand.

12. Claims 1, 2, 5, 6, 12-15, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2001/0031417 A1 (Nagase) combined with US 6,300,027 B1 (Chambers), as evidenced

by US 5,955,530 (Inoue), and applicants' admission in Table 4 at page 38 of the instant specification (applicants' admission I).

Nagase teaches an image forming method that meets the steps recited in the instant claims but for using the particular photoreceptor recited in the instant claims. The Nagase method comprises the steps of: (1) developing a latent image on a photoreceptor with a developer comprising a toner;
(2) transferring the toner image to a recording medium;
(3) fixing the toner image to the recording medium; and
(4) removing the toner remaining on the photoreceptor with a cleaning device. Nagase further teaches a full color image forming method comprising the steps of: (1) forming four electrostatic latent images on four photoreceptors, which correspond to a yellow image, a magenta image, a cyan image, and a black image, respectively; (2) developing the four latent images, respectively, with a yellow toner, a magenta toner, a cyan toner, and a black toner; (3) transferring the yellow toner image, the magenta toner image, the cyan toner image, and the black toner image from the four photoreceptors to a receiving member; (4) fixing the toner images to the receiving member; and (5) cleaning the toner remaining on each of the four photoreceptors with a cleaning device. Figs. 2 and 3; and paragraphs 0078 and 0084-0093. The cleaning device comprises a

cleaning blade. See Fig. 2. Nagase discloses a black toner comprising a colorant, a binder resin, and the ester wax no. 19, pentaerythrytol tetrabehenate. The toner has an average circularity of 0.970 with a standard deviation of circularity of 0.034. Ester compound No. 19 at page 9; Latex 5 in paragraph 0281; black toner 5Bk in Table 1 at page 18. The ester wax no. 19 meets the wax limitations recited in instant claims 1 and 15. The Nagase average circularity and standard deviation of circularity fall within the ranges of average circular degree and standard deviation of circular degree recited in instant claims 1 and 13 and in claim 14, respectively. The Nagase average circularity and standard deviation of circularity have the same definitions as the average circular degree and standard deviation of the circular degree recited in the instant claims. Nagase, paragraphs 0249-0251 and paragraph 4 supra. Nagase further discloses a yellow toner, a magenta toner, and a cyan toner that meet the toner limitations recited in instant claims 1 and 13-15. Yellow toner 5Y in Table 2 at page 19, magenta toner 5M in Table 3 at page 20, and cyan toner 5C in Table 4 at page 20.

As discussed supra, Nagase does not disclose the use of the particular photoreceptor recited in the instant claims.

However, Nagase does not limit the type of photoreceptor used. Nagase, paragraphs 0104-0105.

Chambers discloses a low surface energy organic photoreceptor comprising a conductive substrate, a charge generation layer, and a surface charge transport layer that comprises uniformly dispersed hydrophobicity treated silica particles associated with the tradename AEROSIL R812S. See example 2 at col. 14. Chambers does not disclose the particle size of the silica particles. However, Inoue discloses that hydrophobic silica particles associated with the tradename AEROSIL R812S have a number average particle size of 7 nm. Inoue, col. 3, lines 12-14 and 21-25, and col. 4, lines 26-28. The number average particle size of 7 nm is within the number average particle diameter range of 1 nm to less than 100 nm recited in instant claim 19. Thus, the Chambers photoreceptor surface layer meets the surface layer compositional limitations recited in instant claims 1, 2, 12, and 19. According to Chambers, its photoreceptor having a low surface energy provides the benefits of decreased toner adhesion, improved toner transfer, and increased wear resistance. The photoreceptor has improved cleaning properties and cycling stability. Col. 3, lines 38-48, and example 2.

Chambers does not disclose that its surface charge

transport layer has a surface roughness Ra of not less than 0.02 μm and less than 0.1 μm as recited in instant claim 1. However, as discussed above, the Chambers photoreceptor surface layer meets the surface layer compositional limitations recited in instant claims 1, 2, 12, and 19. Moreover, as discussed above, Chambers teaches that its surface layer photoreceptor having a low surface energy provides the benefits of decreased toner adhesion, i.e., toner filming. According to the instant specification, when the surface layer of the photoreceptor has a surface roughness Ra within the surface roughness Ra range recited in instant claim 1, after 100,000 copies, the photoreceptor had a few to little foreign matter adhered to the surface of the photoreceptor. See the instant specification, Table 4 at page 38, examples 1-3 and 6. When the surface roughness Ra is outside the range recited in instant claim, e.g., a Ra of 0.20 or 0.15 μm, after 100,000 copies, the photoreceptor had foreign matter adhered to the surface of the photoreceptor. See the instant specification, Table 4 at page 38, examples 4, 5, and 7. Thus, because the Chambers photoreceptor surface layer meets the surface layer compositional limitations recited in instant claims 1, 2, 12, and 19, and because Chambers teaches that said layer decreases toner adhesion, a property sought by applicants, it is

reasonable to presume that the Chambers photoreceptor surface layer has a surface roughness Ra as recited in instant claim 1. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Chambers, to use the Chambers photoreceptor in the image forming methods disclosed by Nagase. That person would have had a reasonable expectation of successfully obtaining image forming methods that have improved stability and provides stable images for many repeated runs.

13. Claims 3, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagase combined with Chambers as evidenced by Inoue and Applicants' admission I, as applied to claim 1 above, further combined with US 6,338,929 B1 (Hagi).

Nagase combined with Chambers, as evidenced by Inoue and applicants' admission I, renders obvious an image forming method as described in paragraph 12 above, which is incorporated by reference.

Nagase does not disclose that its toner comprises a metal salt of a fatty acid as recited in the instant claims. However, Nagase discloses that the toner may comprise "so-called external

additives" for the purpose of "improving fluidity as well as chargeability, and of enhancing cleaning properties" of the toner. Nagase does not limit the type of external additives used. Paragraph 0191.

Hagi teaches toners comprising toner particles and a combination of four particular external additives. The combination of external additives comprises: (1) hydrophobic silica particles having a number-average particle size of 30 nm; (2) titanium oxide particles having a number-average particle size of 50 nm; (3) titanium oxide particles having a number-average particle size of 200 nm; and (4) calcium stearate having a volume average particle size of 5 μm in an amount of 0.1 wt% of the toner. See col. 9, lines 53-68; col. 10, lines 1-14; and Table 1 at col. 11, example 2. The calcium stearate disclosed by Hagi meets the limitations of the fatty acid salt recited in instant claims 3 and 16. The calcium stearate amount of 0.1 wt% of the toner is within the amount range of 0.01 to 10% by weight of the toner recited in instant claim 17. Accordingly to Hagi, when a toner comprises such a combination of external additives, the adhesion and wearability of the surface of the photosensitive material is suppressed, and the toner "exhibits the excellent rising property of the electrification, environmental stability and durability." Col. 2, lines 12-22.

Hagi further teaches that by externally adding the fatty acid metal salt, i.e., calcium stearate, to the toner, a "lubricative film is uniformly formed on the surface of the photosensitive member to prevent the adhesion on said surface, and the occurrence of BS [black spots] can be prevented (a lubricating function)." Col. 5, lines 53-57, and Table 3 at col. 13, example 2.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Hagi, to use the combination of the four particular external additives in example 2 of Hagi, which includes calcium stearate in an amount of 0.1 wt% of the toner, as the external additives in the toner in the image forming method rendered obvious over the combined teachings of Nagase and Chambers, as evidenced by Inoue and Applicants' admission I. That person would have had a reasonable expectation of successfully obtaining an image forming method that suppresses the adhesion and wearability of the surface of the photoreceptor, that provides images with stable image density without the occurrence of fog under various environments, and that provides images without the occurrence of fog after many repeated runs, as disclosed by Hagi.

14. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagase combined with Chambers, as evidenced by Inoue and Applicants' admission I, as applied to claim 5 above, further combined with Japanese Patent 09-274417 (JP'417). See the USPTO English-language translation of JP'417 for cites.

Nagase combined with Chambers, as evidenced by Inoue and Applicants' admission I, renders obvious an image forming method as described in paragraph 12 above, which is incorporated by reference.

Nagase does not disclose the use of a cleaning blade or a cleaning brush as recited in instant claims 6-11. However, as discussed in paragraph 11 above, Nagase discloses that the cleaning device can comprise a cleaning blade. See Fig. 2. Nagase does not limit the type of cleaning device used.

JP'417 discloses a cleaning device for removing toner from an organic photoreceptor. The cleaning device comprises an elastic rubber cleaning blade **5** and a brush **4**. Translation, Fig. 1 and paragraphs 0013 and 0023. The cleaning blade **5** contacts the photoreceptor in a direction counter to the rotating direction of the photoreceptor, as recited in instant claim 7. Translation, paragraphs 0014 and 0026. The pressure of the cleaning blade **5** to the photoreceptor is from 5 g/cm to 30 g/cm. Translation, paragraphs 0013 and 0023. The brush **5**

comprises fibers having a thickness of 6 to 30 deniers. The density of brush fibers is from 4.5 x 10^2 f/cm^2 to 15.5 x 10^2 f/cm^2. Translation, paragraphs 0017-0019. The cleaning blade **5** meets the cleaning blade limitations recited in instant claims 6-8 and 11. The brush **4** meets the brush limitations recited in instant claim 8-10. According to JP'417, when its cleaning device is used in an image forming method, the cleaning device effectively removes the toner remaining on the photoreceptor without damaging the surface of the photoreceptor and decreasing the wear of the photoreceptor. Translation, paragraphs 0017 and 0025. The image forming method provides good quality images, e.g., up to 200,000 copies, for a long period of time. Paragraphs 0011, 0076, and 0078. JP'417 further discloses that when its cleaning device is not used in the image forming method, the image quality deteriorates after many repeated runs. Paragraph0077, and Table 1, comparison examples 1-7.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'417, to use the JP'417 cleaning device as the cleaning device in the image forming method rendered obvious over the combined teachings of Nagase and Chambers, as evidenced by Inoue and Applicants' admission I. That person would have had a reasonable

expectation of successfully obtaining an image forming method that effectively removes toner remaining on the surface of the photoreceptor and that provides good quality images, e.g., up to 200,000 copies, for a long period of time, as taught by JP'417.

15. Applicants' arguments filed on Jan. 6, 2006, as applied to the rejections set forth in paragraphs 12-14 above have been fully considered but they are not persuasive.

Applicants assert that the combination of the cited prior art in the rejections in paragraphs 12-14 do not teach or suggest the surface roughness Ra recited in instant claim 1.

However, for the reasons discussed in paragraph 12, it is reasonable to presume that the Chambers photoreceptor surface layer has a surface roughness Ra that is within the surface roughness Ra recited in instant claim 1. There is no objective evidence on the present record to show otherwise. Accordingly, the rejections in paragraphs 12-14 stand.

16. Claims 1-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 2001-265040 (JP'040) combined with Uchida. See the USPTO English-language translation of JP'040 for cites.

JP'040 teaches an image forming method comprising the steps of: (1) developing a latent image on a photoreceptor with a developer comprising a toner; (2) transferring the toner image to a recording medium; (3) fixing the toner image to the recording medium; and (4) removing the toner remaining on the photoreceptor with a cleaning device. Translation, Fig. 2; paragraphs 0100-0107 and 0135-0137. The cleaning device comprises an elastic rubber cleaning blade **6** and a brush **4**. Translation, Fig. 1, and paragraphs 0098-0099 and 0136-0137. The cleaning blade **6** contacts the photoreceptor in a direction counter to the rotating direction of the photoreceptor, as recited in instant claim 7. The pressure of the cleaning blade **6** to the photoreceptor is 20 g/cm, which is within the pressure range of 5 to 30 g/cm recited in instant claim 11. Translation, paragraph 0136. The brush **4** comprises fibers having a thickness of 15 deniers, which is within the range of 6 to 30 deniers recited in instant claim 9, and a fiber density of 9.3×10^2 f/cm^2, which is within the fiber density range recited in instant claim 10. Paragraph 0137. The cleaning blade meets the cleaning blade limitations recited in instant claims 6-8 and 11. The brush meets the brush limitations recited in instant claims 8-10.

JP'040 exemplifies a photoreceptor comprising a conductive substrate, a charge generation layer, a charge transport layer, and a surface protective layer comprising inorganic particles, colloidal antimony particles having a number average particle diameter of 15 nm, which is within the number average particle diameter range of 1 nm to less than 100 nm recited in instant claim 19. Translation, paragraphs 0116 to 0122; and photosensitive body 4, paragraph 0124. The JP'040 photoreceptor surface layer in photosensitive body 4 meets the surface layer compositional limitations recited in instant claims 1, 12, and 19. JP'040 further teaches that inorganic particles can equally be colloidal silica, which meets the inorganic particles compositional limitation recited in instant claim 2. Translation, paragraphs 0037 and 0122. The JP'040 photoreceptor surface layer in photosensitive body 4 has a surface roughness Ra of 2.88 nm. See Table 2, embodiment 4. The JP'040 surface roughness Ra has the same definition as the surface roughness Ra recited in instant claim 4. See JP'040, paragraphs 0022 and 0026; and translation, paragraphs 0021-0026; and paragraph 4 supra.

JP'040 further teaches that the toner comprises toner particles and a metal salt of a fatty acid as an external additive. Translation, paragraph 0091, line 2; paragraphs 0093

and 0131-0134. The metal salt of a fatty acid can be, for example, zinc stearate, aluminum stearate, or magnesium stearate, which meet the metal salt of a fatty acid compositional limitation recited in instant claim 16. Translation, paragraph 0091, lines 7-12, and paragraph 0134. The metal salt is present in an amount of 0.01 to 1 mass%, i.e., wt%, based on the weight of the toner. Translation, paragraph 0093. The amount of metal salt of a fatty acid is within the range of 0.01 to 10% by weight recited in instant claim 17.

JP'040 does not exemplify a photoreceptor surface layer having a surface roughness Ra of not less than 0.02 μm (20 nm) to less than 0.1 μm (100 nm) recited in instant claim 1. However, JP'040 teaches that the photoreceptor surface layer can have a surface roughness Ra of 1.5 nm or more and less than 0.1 μm. Translation, paragraph 0008. The JP'040 surface roughness Ra overlaps the surface roughness Ra range recited in instant claim 1. According to JP'040, when its photoreceptor having the above described surface roughness Ra and a toner comprising an external added metal salt of a fatty acid is used in an image forming method that comprises a cleaning step, the affinity of the photoreceptor and fatty acid metal salt is "uniquely improved, thus fatty acid metal salt thin film is

uniformly and effectively formed on the" photoreceptor, "thus cleaning performance is made good." Translation, paragraph 0018. JP'040 teaches that the combination of its photoreceptor and a toner comprising an externally added metal salt of a fatty acid provides images with no image defects for a long time. Translation, paragraphs 0006 and 0143.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'040, to vary, by routine experimentation, the surface roughness Ra of the photoreceptor 4 of JP'040 such that the surface roughness of surface layer is within the surface roughness range of 0.02 to less than 0.1 μm recited in instant claim. It would also have been obvious for that person to use the resultant photoreceptor in the image forming method disclosed by JP'040. That person would have had a reasonable expectation of successfully obtaining image forming methods that have good photoreceptor cleaning performance and that provide images with no image defects for a long time as taught by JP'040.

JP'040 does not exemplify the use of a toner having the particular average circle degree and comprising the particular wax recited in instant claims 1 and 13-15. However, JP'040 does not limit the composition of the toner nor its particle. Translation, paragraph 0093.

Uchida discloses black toner particles that comprise a wax that meets the wax compositional limitations recited in instant claims 1 and 15 and that have an average circle degree and a standard deviation of the average circle degree fall within the ranges of average circular degree and standard deviation of circular degree recited in instant claims 1 and 13 and in claim 14, respectively. The discussion of Uchida in paragraph 9 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Uchida, to use the Uchida toner particles in the image forming method rendered obvious over the teachings of JP'040. That person would have had a reasonable expectation of successfully obtaining an image forming method that provide stable high quality single toner images as taught by Uchida.

17. Claims 1-3, 5, 6, and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagase combined with JP'040. See the USPTO English-language translation of JP'040 for cites.

Nagase teaches an image forming method that meets the steps recited in the instant claims but for using the particular photoreceptor recited in the instant claims. The discussion of

Nagase in paragraph 12 above is incorporated herein by reference.

As discussed supra, Nagase does not disclose the use of the particular photoreceptor recited in the instant claims. Nor does Nagase disclose that its toner comprises a metal salt of a fatty acid as recited in the instant claims. However, Nagase does not limit the type of photoreceptor used. Nagase, paragraphs 0104-0105. Nor does Nagase limit the type of external additives used. Paragraph 0191. Nagase discloses that the toner may comprise "so-called external additives" for the purpose of "improving fluidity as well as chargeability, and of enhancing cleaning properties" of the toner.

JP'040 discloses the use of an organic photoreceptor with a toner comprising a metal salt of a fatty acid as an external additive. Translation, paragraphs 0008-0009. The JP'040 photoreceptor comprises a conductive substrate, a charge generation layer, a charge transport layer, and a surface protective layer comprising inorganic particles, colloidal antimony particles having a number average particle diameter of 15 nm, which is within the number average particle diameter range of 1 nm to less than 100 nm recited in instant claim 19. Translation, paragraphs 0116 to 0122; and photosensitive body 4, paragraph 0124. The JP'040 photoreceptor surface layer in

photosensitive body 4 meets the surface layer compositional limitations recited in instant claims 1, 12, and 19. JP'040 further teaches that inorganic particles can equally be colloidal silica, which meets the inorganic particles compositional limitation recited in instant claim 2. Translation, paragraphs 0037 and 0122. The JP'040 photoreceptor surface layer in photosensitive body 4 has a surface roughness Ra of 2.88 nm. See Table 2, embodiment 4. The JP'040 surface roughness Ra has the same definition as the surface roughness Ra recited in instant claim 4. See JP'040, paragraphs 0022 and 0026; and translation, paragraphs 0021-0026; and paragraph 4 supra.

As discussed above, JP'040 further teaches a toner comprising toner particles and a metal salt of a fatty acid as an external additive. Translation, paragraph 0091, line 2; paragraphs 0093 and 0131-0134. The metal salt of a fatty acid can be, for example, zinc stearate, aluminum stearate, or magnesium stearate, which meet the metal salt of a fatty acid compositional limitation recited in instant claim 16. Translation, paragraph 0091, lines 7-12, and paragraph 0134. The metal salt is present in an amount of 0.01 to 1 mass%, i.e., wt%, based on the weight of the toner. Translation, paragraph 0093. The amount of metal salt of a fatty acid is

within the range of 0.01 to 10% by weight recited in instant claim 17.

JP'040 does not exemplify a photoreceptor surface layer having a surface roughness Ra of not less than 0.02 μm (20 nm) to less than 0.1 μm (100 nm) recited in instant claim 1. However, JP'040 teaches that the photoreceptor surface layer can have a surface roughness Ra of 1.5 nm or more and less than 0.1 μm. Translation, paragraph 0008. The JP'040 surface roughness Ra overlaps the surface roughness Ra range recited in instant claim 1. According to JP'040, when its photoreceptor having the above described surface roughness Ra and a toner comprising an external added metal salt of a fatty acid is used in an image forming method that comprises a cleaning step, the affinity of the photoreceptor and fatty acid metal salt is "uniquely improved, thus fatty acid metal salt thin film is uniformly and effectively formed on the" photoreceptor, "thus cleaning performance is made good." Translation, paragraph 0018. JP'040 teaches that the combination of its photoreceptor and a toner comprising an externally added metal salt of a fatty acid provides images with no image defects for a long time. Translation, paragraphs 0006 and 0143.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'040, to vary,

by routine experimentation, the surface roughness Ra of the photoreceptor 4 of JP'040 such that the surface roughness of surface layer is within the surface roughness range of 0.02 to less than 0.1 μm recited in instant claim. It would also have been obvious for that person to use the resultant photoreceptor and to use a metal salt of a fatty acid, such as zinc stearate, as taught by JP'040 as an external additive in the toner in the image forming methods disclosed by Nagase. That person would have had a reasonable expectation of successfully obtaining image forming methods that have good photoreceptor cleaning performance and that provide images with no image defects for a long time as taught by JP'040.

18. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagase combined with JP'040, as applied to claim 5 above, further combined with JP'417. See the USPTO English-language translation of JP'417 and the JPO translation of JP'040 for cites.

Nagase combined with JP'040 renders obvious an image forming method as described in paragraph 17 above, which is incorporated by reference.

Nagase does not disclose the use of a cleaning blade or a cleaning brush as recited in instant claims 6-11. However, as

discussed in paragraph 17 above, Nagase discloses that the cleaning device can comprise a cleaning blade. See Fig. 2. Nagase does not limit the type of cleaning device used.

JP'417 discloses a cleaning device for removing toner from an organic photoreceptor that comprises an elastic rubber cleaning blade **5** and a brush **4** that meet the limitations recited in instant claims 6-11. The discussion of JP'417 in paragraph 14 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'417, to use the JP'417 cleaning device as the cleaning device in the image forming method rendered obvious over the combined teachings of Nagase and JP'040. That person would have had a reasonable expectation of successfully obtaining image forming methods that effectively remove toner remaining on the surface of the photoreceptor and that provides good quality images, e.g., up to 200,000 copies, for a long period of time, as taught by JP'417.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Mr. Nam Nguyen,

can be reached on (571) 272-1342. The central fax phone number is (571) 273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

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JLD
Jun. 20, 2006

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